

## CLAIMS

1. An injection molding system comprising:

an injection molding apparatus;

an air feeder for feeding at least air from an opposite side to a nozzle of the injection molding apparatus;

a resin pellet feeding passage for feeding resin pellets into the injection molding apparatus;

a pellet feeding regulator for controlling a feed of the resin pellets from a resin pellet feeding passage into the injection molding apparatus;

a pellet exhaust gas passage for passing moisture and exhaust gas which are generated when the resin pellets melt in the injection molding apparatus; and

a decompressor connected to the exhaust gas passage for exhausting the moisture and the exhaust gas from a pellet feeding passage side to an outside of the injection molding apparatus.

2. An injection molding system comprising:

an injection molding apparatus;

an air feeder for feeding at least air from an opposite side to a nozzle of the injection molding apparatus;

a resin pellet feeding passage for feeding resin pellets into the injection molding apparatus;

a pellet feeding regulator for controlling a feed of the resin pellets from a resin pellet feeding passage into the injection molding apparatus;

a pellet exhaust gas passage for passing moisture and exhaust gas which are generated when the resin pellets melt in the injection molding apparatus; and

a decompressor connected to the exhaust gas passage for exhausting the moisture and the exhaust gas from the pellet feeding passage side to the outside of the injection molding apparatus, and moisture and exhaust gas which are generated in a die.

3. An injection molding system comprising:

an injection molding apparatus;

an air feeder for feeding at least air from an opposite side to a nozzle of the injection molding apparatus;

a resin pellet feeding passage for feeding resin pellets into the injection molding apparatus;

a pellet feeding regulator for controlling a feed of the resin pellets from a resin pellet feeding passage into the injection molding apparatus;

a pellet exhaust gas passage for passing moisture and exhaust gas which are generated when the resin pellets melt in the injection molding apparatus;

a decompressor connected to the exhaust gas passage for exhausting the moisture and the exhaust gas from a pellet feeding passage side to an outside of the injection molding apparatus; and

a device for preventing the moisture and the exhaust gas which pass through the gas exhaust passage from contacting the resin pellets passing through the pellet feeding passage, with the moisture and the exhaust gas passing through a space outside the pellet feeder.

4. An injection molding system comprising:

an injection molding apparatus;

an air feeder for feeding at least air from an opposite side to a nozzle of the injection molding apparatus;

a resin pellet feeding passage for feeding resin pellets into the injection molding apparatus;

a pellet feeding regulator for controlling a feed of the resin pellets from a resin pellet feeding passage into the injection molding apparatus;

a pellet exhaust gas passage for passing moisture and exhaust gas which are generating when the resin pellets melt in the injection molding apparatus;

a decompressor connected to the exhaust gas passage for exhausting the moisture and the exhaust gas from a pellet feeding passage side to an outside of the injection molding apparatus; and

a removing apparatus placed at the exhaust gas passage.

5. An injection molding system comprising:

an injection molding apparatus;

an air feeder for feeding at least air from an opposite side to a nozzle of the injection molding apparatus;

a resin pellet feeding passage for feeding resin pellets into the injection molding apparatus;

a pellet feeding regulator for controlling a feed of the resin pellets from the resin pellet feeding passage into the injection molding apparatus;

an exhaust gas passage for passing moisture and exhaust gas which are generated when the resin pellets melt in the injection molding apparatus;

a decompressor connected to the exhaust gas passage for exhausting the moisture and the exhaust gas from a pellet feeding passage side to an outside of the injection molding apparatus; and

a detector for detecting an accumulation amount of the resin pellets situated inside a cylinder of the injection molding apparatus.

6. An injection molding system comprising:

an injection molding apparatus;

an air feeder for feeding at least air from an opposite side to a nozzle of the injection molding apparatus;

a resin pellet feeding passage for feeding resin pellets into the injection molding apparatus;

a pellet feeding regulator for controlling a feed of the resin pellets from the resin pellet feeding passage into the injection molding apparatus;

an exhaust gas passage for passing moisture and exhaust gas which are generated when the resin pellets melt in the injection molding apparatus;

a decompressor connected to the exhaust gas passage for exhausting the moisture and the exhaust gas from a pellet feeding passage side to an outside of the injection molding apparatus.

a detector for detecting an accumulation amount of the resin pellets situated inside a cylinder of the injection molding apparatus;

a device for preventing the moisture and the exhaust gas which pass through the exhaust gas passage from contacting with the resin pellets passing through the pellet feeding passage; and  
a removing apparatus placed at the exhaust gas passage.

7. The injection molding system of claim 1, 2, 3, 4, 5 or 6, wherein the degree of decompression of said decompressor is about 40 Kpa (300 torr) or more.

8. The injection molding system of claim 7, wherein the degree of compression is about 70 Kpa or more.

9. The injection molding system of claim 7, wherein the degree of compression is about 80 Kpa to 95 Kpa.

10. The injection molding system of claim 5 or 6, wherein said detector is situated within about 10 mm from an upper end of a flight of a screw inside the cylinder.

11. A resin pellet feeding unit comprising:

a device for automatically feeding pellets with a vacuum interception valve to intercept a pellet storage tank;

a resin pellet feeding passage for feeding resin pellets into an injection molding apparatus;

a pellet feeding regulator for controlling a feed of the resin pellets from the resin pellet feeding passage into the injection molding apparatus;

an exhaust gas passage for passing moisture and exhaust gas which are generated when the resin pellets melt in the injection molding apparatus; and

a decompressor connected to the exhaust gas passage for exhausting the moisture and the exhaust gas from a pellet feeding passage side to an outside of the injection molding apparatus.

12. A resin pellet feeding unit comprising:

a resin pellet feeding passage for feeding resin pellets into an injection molding apparatus;  
a pellet feeding regulator for controlling feed of the resin pellets from the resin pellet feeding passage into the injection molding apparatus;

an exhaust gas passage for passing moisture and exhaust gas which are generated when the resin pellets melt in the injection molding apparatus;

a decompressor connected to the exhaust gas passage for exhausting the moisture and the exhaust gas from a pellet feeding passage side to an outside of the injection molding apparatus; and

a device for preventing the moisture and the exhaust gas which pass through the exhaust gas passage from contacting the resin pellets passing through the pellet feeding passage.

13. A resin pellet feeding unit comprising:

a resin pellet feeding passage for feeding resin pellets into an injection molding apparatus;  
a pellet feeding regulator for controlling a feed of the resin pellets from the resin pellet feeding passage into the injection molding apparatus;

an exhaust gas passage for passing moisture and exhaust gas which are generated when the resin pellets melt in the injection molding apparatus;

a decompressor connected to the exhaust gas passage for exhausting the moisture and the exhaust gas from a pellet feeding passage side to an outside of the injection molding apparatus; and

a detector for detecting an accumulation amount of the resin pellets deposited in the injection molding apparatus, the detector disposed inside a cylinder of the injection molding apparatus.

14. A resin pellet feeding unit comprising:

a resin pellet feeding passage for feeding resin pellets into an injection molding apparatus;

a pellet feeding regulator for controlling a feed of the resin pellets from the resin pellet feeding passage into the injection molding apparatus;

an exhaust gas passage for passing moisture and exhaust gas which are generated when the resin pellets melt in the injection molding apparatus;

a decompressor connected to the exhaust gas passage for exhausting the moisture and the exhaust gas from a pellet feeding passage side to an outside of the injection molding apparatus; and

a removing apparatus placed at the exhaust gas passage.

15. A resin pellet feeding unit comprising:

a resin pellet feeding passage for feeding resin pellets into an injection molding apparatus;

a pellet feeding regulator for controlling feed of the resin pellets from the resin pellet feeding passage into the injection molding apparatus;

an exhaust gas passage for passing moisture and exhaust gas which are generated when the resin pellets melt in the injection molding apparatus;

a decompressor connected to the exhaust gas passage for exhausting the moisture and the exhaust gas from a pellet feeding passage side to an outside of the injection molding apparatus;

a detector for detecting an accumulation amount of the resin pellets deposited in the injection molding apparatus, the detector disposed inside a cylinder of the injection molding apparatus;

a device for preventing the moisture and the exhaust gas which pass through the exhaust gas passage from contacting the resin pellets passing through the pellet feeding passage; and

a removing apparatus placed at the exhaust gas passage.

16. A resin pellet feeding unit of claim 13 or 15, wherein said detector is provided on said pellet feeder or a water jacket of the cylinder.

17. A resin pellet feeding unit of claim 13 or 15, wherein said pellet feeder extends inside the cylinder.

18. A resin pellet feeding unit of claim 16, wherein said detector is situated within about 10 mm from an upper end of a flight of a screw inside the cylinder.

19. A resin pellet feeding unit of claim 11, 12 or 15, wherein said device for preventing contact is provided on the pellet feeder and the exhaust gas passage.

20. A resin pellet feeding unit of claim 19, wherein said pellet feeder is made of copper.

21. A resin pellet feeding unit of claim 14 or 15, wherein said removing apparatus is provided on the exhaust gas passage.



22. An injection molding process comprising the steps of:

feeding resin pellets to provide a given space between a location of an accumulation amount of the resin pellets inside of a cylinder and an inner wall of the cylinder of an injection molding apparatus; and

exhausting, out of the cylinder, exhaust gas and moisture generated when the resin pellets melt in the cylinder as well as air fed from an opposite side to a nozzle of a front end of the cylinder from a pellet feeding side of a pellet feeding zone of the cylinder through a pellet exhaust gas passage by reducing pressure, of a predetermined decompression degree, inside of the cylinder through continuous driving of a vacuum pump which acts as a decompressor during operation of the injection molding apparatus.

23. An injection molding process comprising the steps of:

feeding resin pellets to provide a given space between a location of an accumulation amount of the resin pellets inside of a cylinder and an inner wall of the cylinder of an injection molding apparatus, the feeding of the resin pellets being carried out without contacting exhaust gas and moisture generated when the pellets are melted inside of the cylinder; and

exhausting, out of the cylinder, exhaust gas and moisture generated when the resin pellets melt in the cylinder as well as air fed from an opposite side to a nozzle of a front end of the cylinder from a pellet feeding side of a pellet feeding zone of the cylinder through a pellet exhaust gas passage by reducing pressure inside of the cylinder through driving of a vacuum pump which acts as a decompressor.

24. An injection molding process comprising the steps of:

feeding resin pellets to provide a given space between a location of accumulation amount of the resin pellets inside of a cylinder and an inner wall of the cylinder of an injection molding apparatus; and

exhausting, out of the cylinder, exhaust gas and moisture generated when the resin pellets melt in the cylinder as well as air fed from an opposite side to a nozzle of a front end of the cylinder from a pellet feeding side of a pellet feeding zone of the cylinder through a pellet exhaust gas passage by reducing pressure, of a predetermined decompression degree, inside of the cylinder through continuous driving of a vacuum pump which acts as a decompressor during operation of the injection molding apparatus.

25. An injection molding process comprising the steps of:

feeding resin pellets to provide a given space between a location of an accumulation amount of the resin pellets inside of a cylinder and an inner wall of the cylinder of an injection molding apparatus;

exhausting, out of the cylinder, exhaust gas and moisture generated when the resin pellets melt in the cylinder as well as air fed from an opposite side to a nozzle of a front end of the cylinder from a pellet feeding side of a pellet feeding zone of the cylinder through a pellet exhaust gas passage by reducing pressure, of a predetermined decompression degree, inside of the cylinder through continuous driving of a vacuum pump which acts as a decompressor during operation of the injection molding apparatus; and

detecting a location of the accumulation amount of the resin pellets to control the feeding of the resin pellets based on the detection information.

26. An injection molding process of claim 22, 23, 24 or 25, wherein a degree of decompression is set at 400 Kpa (about 300 Torr) or more.

27. The injection molding process of claim 26, wherein the degree of decompression is about 70 Kpa or more.

28. The injection molding process of claim 26, wherein the degree of decompression is about 80 Kpa to 95 Kpa.

FIG. 10